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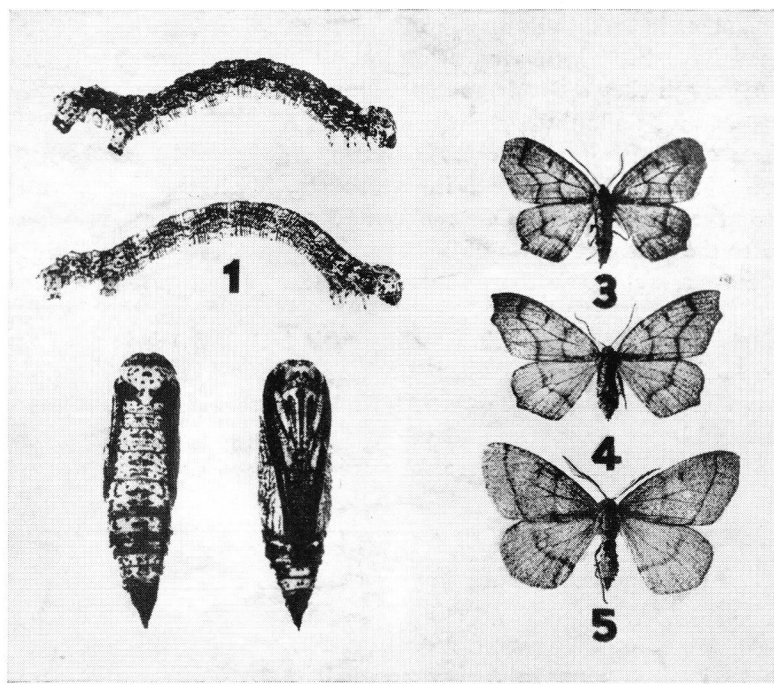
No. 51

HEMLOCK LOOPERS

by

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Courtesy Canadian Dept. of Agr.

Lambdina fiscellaria fiscellaria (Gn.) 1. Larvae; 2. Pupae; 3, 4, adults.
L. atbasaria atbasaria (Walk.) 5. adult.

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HEMLOCK LOOPERS

Lambdina fiscellaria fiscellaria (Guenée) and
Lambdina athasaria athasaria (Walker)

History and Distribution: Two of the most important defoliators of hemlock in the northeastern part of the United States are the closely related species *Lambdina fiscellaria fiscellaria* and *L. athasaria athasaria*. The former was first described by Guenée in 1857 as *Ellopia fiscellaria*, and the latter by Walker in 1860 as *Ellopia athasaria*. Both are native to North America, and they have been attracting attention at irregular intervals since about 1902. Although they differ in their life cycle, they are similar in appearance and habits, and undoubtedly the two species have often been confused. Infestations of *L. fiscellaria fiscellaria* have been reported from Manitoba to Newfoundland in Canada and in Wisconsin, Michigan, New York, and Maine in the United States. Outbreaks of *L. athasaria athasaria* have occurred farther to the south, extending from Ohio and West Virginia to Connecticut, Massachusetts, and the southern part of New Hampshire.

Host Trees: Hemlock (*Tsuga canadensis* (L.) Carr.) is favored by both species. *L. fiscellaria fiscellaria* has also been recorded as a serious defoliator of balsam fir (*Abies balsamea* (L.) Mill). In addition they sometimes attack northern white cedar, paper and yellow birch, wild cherry, larch, maples, oak, and spruce, especially where they are associated with the favored food trees.

One complete defoliation is fatal to hemlock and balsam fir, but trees having up to 90 percent defoliation may recover. The site conditions, stand density, age, height, borer populations, and climatic conditions, together with the degree of defoliation, must all be taken into consideration in selective cutting operations following an attack by these loopers.

Evidences of Infestation: An abundance of the loopers (sometimes called inchworms or spanworms) feeding on hemlock or balsam gives the trees a brownish tinge. Generally a thinning of the foliage shows up first in the upper parts of the crowns in July and early in August. A close examination of the stand at that time will disclose a green carpeting of gnawed needles beneath the host trees. The slightest disturbance of the trees causes numerous loopers to spin down on silken threads. The adults of *L. fiscellaria fiscellaria* emerge late in August and in September, and those of *L. athasaria athasaria* late in May and in June. Jarring a few green branches of the host trees during these periods will cause moths to take flight, thus giving a warning of possible damage in the next feeding season.

Description: The moths of *L. fiscellaria fiscellaria* vary in color from a creamy tan to a grayish brown with a purplish tinge. They have a wing expanse of about $1\frac{1}{4}$ inches. The fore wings are crossed transversely by two irregular dusky lines, the discal dot between them, and sometimes the outer line is bordered externally with yellow. On the hind wings is a line which appears to be a continuation of the outer line of the fore wings. The head and front of the prothorax are light yellow; the body is ash-colored with a brownish tinge. The moths of *L. athasaria athasaria* are similar in size, but have thinner wings, are smoky to ash gray in color, and the transverse lines are not always sharply defined.

The eggs of both species are broadly oval and light green in color at first, later changing to brown.

The newly hatched larvae, or loopers, are dull white with brownish heads; later they become greenish with faint, irregular dark markings. The full-grown larvae of both species are similar in appearance and size. They are about $1\frac{1}{4}$ inches in length and are yellowish with dark markings, some specimens being much darker than others. The head is marked with irregular brown or blackish spots. The body above is obscurely marked with areas of brown, white, and yellow; the sides are much darker, with wavy lines of dark or reddish brown interrupted by an occasional dash of yellowish white; the underside has five broken, wavy brown lines, sometimes indistinct.

The pupae are yellowish brown with darker markings, and vary from about $\frac{1}{2}$ to $\frac{5}{8}$ inch in length.

Life History: The moths of *L. fiscellaria fiscellaria* emerge during the latter half of August and in September. The eggs are usually deposited on the twigs and needles, either singly or in small groups. It has also been reported that the eggs are sometimes deposited in crevices on the bark and on old stumps. The winter is passed in the egg stage. They hatch early in June, and the larvae become fully grown in August. They transform to pupae in the litter and in crevices in the bark of the host trees.

The moths of *L. athasaria athasaria* emerge in May and June, and the females deposit their eggs singly and in small groups on the needles and twigs of the host trees. Hatching occurs from late in June to early in July, and the larvae attain full growth in the latter half of September. The larvae transform to pupae just beneath the top crust of the leaf mold, and the winter is passed in the pupal stage.

Habits: When disturbed, the loopers spin down and drop or remain suspended for some time on their silken threads. In feeding they cut off the needles near the base, or they eat only one side of the needle, causing the remaining part to dry up and thus give a brownish tinge to the foliage.

Natural Control: Parasites, predators, diseases, and the weather each plays an important role in the control of these loopers. The great rapidity with which outbreaks develop, followed by a sudden decline of the infestations, is evidence of the importance of natural control factors.

Control with Sprays: When young loopers are found in abundance early in July, serious damage can be prevented by spraying immediately, as these caterpillars consume the greatest volume of foliage after they become half grown. An oil solution containing 12 percent of DDT, applied by airplane at the rate of 1 gallon per acre, is recommended for woodland areas. For small areas accessible to roads and for ornamental plantings of hemlock an emulsion containing 6 percent of DDT applied by a mist blower at the rate of 2 gallons per acre is recommended.



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